



1744

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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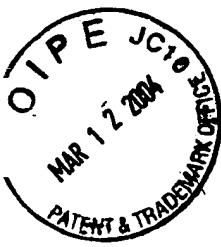
Honorable Commissioner for Patents

Sir,

This Amendment and Response is submitted in response to the Examiner's Office Action dated 01/20/2004.

**Introductory Comments**

To comply with the examiner's requirements related to drawings, I send you the new drawings. They replace all the original drawings and show the simplest embodiment of the paint roller frame designed according to the remaining Claims 1 – 4 and 6 – 8. The new Brief Description of The Drawings corresponds to these new drawings. The drawings are further elaborated in the new Description of The Preferred Embodiment.



### Amendments to the Brief Description of The Drawings

Please, replace the original Brief Description of The Drawings by the following description:

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of the preferred embodiment of the paint roller frame according to the present invention.

FIG. 2 is an exploded perspective view of the paint roller frame with the clip-on end wig according to the present invention shown while painting the corner.

FIG. 3 is a fragmentary cross sectional view of the preferred embodiment of the paint roller frame according to the present invention.

FIG. 4 is a fragmentary top plan view of the roller cage shown in FIG. 1 when the roller cage is adjusted for the smallest possible roller sleeve length it can work with.

FIG. 5 is a fragmentary cross sectional view of the connecting tube through line 5 - 5 of FIG. 4.

FIG. 6 is a cross sectional view of the shaft through line 6 - 6 of FIG. 3 with a fragmentary plan view of the preferred embodiment of the attached hook.

FIG. 7 is a cross sectional view of the shaft along line 7 - 7 of FIG. 3 that shows a plastic sheathing around the shaft.

FIG. 8 is a plan view of the roller frame handle with a portion of the shaft and represents a continuation of FIG. 3.

FIG. 9 is a cross sectional view of the hook permanently attached to the shaft along line 9 - 9 of FIG. 8.

FIG. 10 is an exploded perspective view of a conventional 5-gallon paint bucket filled with more than 3 gallons of paint where the paint roller frame resting on the grid has a hook according to the present invention.

FIG. 11 is an exploded perspective view of the same bucket where the conventional paint roller frame is resting on the grid.

## **Amendments to the Description of The Preferred Embodiment**

Please, replace the original Description of The Preferred Embodiment by the following description:

### **DESCRIPTION OF THE PREFERRED EMBODIMENT**

Preferred embodiments of the present invention may be best illustrated by referring to the attached figures. Shown in FIG. 3 is the preferred embodiment 1 of a paint roller frame according to the present invention. It has the leak-proof roller cage 8 adjustable to two standard paint roller sleeve lengths and any intermediate length, the hook 400 to hang the paint roller frame on a grid, the shaft 2 that is covered with a plastic sheathing 800, an improved shape of the shaft, and the clip-on end wig 700.

The paint roller frame 1 in accordance with this invention comprises a shaft 2, which may, for example, be made from a heavy wire bent to shape. Suitably secured to the handle portion 175 of the shaft is a conventional handle.

Rotatably mounted on the shaft 2 is a roller cage assembly 8. It can be used for two standard roller sleeve sizes, for example, 7" and 9", and, if needed, any intermediate size. The cage assembly 8 comprises a bearing portion 110 with a male thread 141 on its outer end and an outer portion 150 with a mating female thread 159. The outer portion can be screwed to the bearing portion and unscrewed when it is needed.

The bearing portion for this design is an assembly that comprises an inner bearing 120 and an outer bearing 140, which are connected by a tube 130. The tube also serves as a support for a paint roller sleeve 790 that is shown in ghost outline. Unlike conventional roller cage assemblies where roller sleeve supporting means are also used to retain the sleeve on the cage, the supporting tube 130 is not frictionally engaged with the roller sleeve core 791 and does not prevent the sleeve from axial sliding. As a result, the paint roller sleeve can be effortlessly taken from the supporting tube 130 unless any retaining means are engaged.

The roller sleeve core 791 is fixed on the roller cage only because it is trapped between an annular face 111 of the inner bearing 120 and an outer annular face 151 of the outer portion 150. The outer portion 150 can be removed to permit replacement of the roller sleeve. After the paint roller sleeve is replaced, the outer portion 150 must be urged against the paint roller sleeve core to tightly squeeze the sleeve. Two resilient washers 115 and 155 are placed between the core 791 and the annular faces 111 and 151 to improve the sealing of the roller cage assembly's interior and completely inhibit paint flow inside the roller cage assembly along the core interior surface. The washers' round shape in cross section is ideal to provide a perfect seal of the core's interior and easily create a reactive force that would increase friction in the tread connection and eliminate the risk of occasional unscrewing of the outer portion 150. The squeeze is controlled by the painter and requires a reasonable judgment. The inner bearing 120 and the outer portion 150 have recesses 126 and 156 near faces 111 and 151 to better retain washers 115 and 155, correspondingly.

The roller cage assembly 8 is retained on the shaft 2 by a locking sleeve 121 and two protrusions 176. The locking sleeve 121 is secured in its positions on the shaft 2 with

the help of a headless screw 122. A plastic washer 124 is placed between the locking sleeve 121 and the inner bearing 120 to minimize friction.

The inner bearing 120 is connected to the tube 130 by a headless screw 133 that comes through the threaded hole in the tube 130 to reach the bearing 120. To retain the tube 130, the screw 133 has its top above the surface of the inner bearing 120, but below the supporting surface of the tube 130 to allow the roller sleeve be put on the roller cage. The inner bearing 120 also has an opening 116 for the shaft 2 to put through. This opening is a usual source for paint leaking inside the roller cage in conventional paint roller frames. A washer 117 that is placed tightly in a recess of the inner bearing 120 eliminates leaking through the opening 116 along the shaft 2 while allowing free rotation of the roller cage. The metal washer 118 is provided for smooth rotation of the roller cage assembly 8.

The outer bearing 140 has an opening 146 to be mounted on the shaft 2. The outer bearing 140 is connected to the tube 130 by a screw 142 in the area close to its inner end. The opposite end of the outer bearing 140 has a male thread 141. The screw 142 accesses the bearing 140 through the slot 138. FIG. 4 shows a fragmentary top plan view of the roller cage shown in FIG. 3, and FIG. 5 is a fragmentary cross view of the roller cage through line 5 – 5 of FIG. 4 to better explain the shape of the slot 138 and position of the screw 142. When the bearing 140 is in such a position that the tube 130 is connected to it with the screw 142 located in the outmost inner position of the slot as shown in FIG. 4, the roller cage is prepared for placement of the shortest paint roller sleeve it can be possibly used with. The roller cage assembly can be adjusted to fit a longer sleeve by loosening the screw 142, pulling the bearing 140 off, and tightening the screw. The outmost outer position of the screw 142 in the slot 138 corresponds to the longest possible roller sleeve that can be used with the roller frame as shown in FIG. 3. Intermediate positions of the screw 142 can be used to accommodate any non-standard roller sleeve length between the two standard lengths.

The outer portion 150 has a knurl 157 on the cylinder surface of the outer annular face. The knurl creates more convenience for screwing-unscrewing of the outer portion. It also creates enough friction to securely retain a clip-on wig 700 shown in the FIG. 3. The clip-on wig 700 comprises a plastic cap 710 and a painting portion 720 that is made of a material similar to the covering of the paint roller sleeve.

As it is clear from FIG. 3, the roller cage assembly 8 can be disassembled by

- unscrewing the outer portion 150 and the screws 142 and 133
- removing the outer bearing 140 and the tube 130
- unscrewing the screw 122
- removing the locking sleeve 121, the washer 124, the inner bearing 120, and the washers 117 and 118.

After this all the parts of the roller cage assembly are accessible for inspection and maintenance. Weary parts, for example the washer 117 in case of leaks through the opening 116, can be replaced.

Shown in FIG. 3 and FIG. 7 the plastic sheathing 800 covers a part of the shaft 2 that often touches walls while painting. It eliminates the source of dark spots that are unavoidable when painting by a conventional roller frame. The sheathing covers the shaft's portion 172 and extends up to the portion 173. FIG. 3 also shows how the intermediate portion 173 softens the traditional shape of conventional shafts that includes

only the perpendicular portions 172 and 171. Such a shape provides a greater convenience and reduces wall touching by the shaft while working in narrow places.

Finally, FIG. 3 shows a sectional view of the hook 400 permanently attached to the shaft's handle portion 3. The hook comprises two generally flat symmetric parts 401 and 402 with the middle portions 403 and 404 that are arch-shaped for a better contact with the shaft's handle portion 175. FIG. 6 shows a fragmentary cross view of the shaft and the attached hook taken along line 6 – 6 of FIG. 3. The angle  $\alpha$  and the dimensions W and H should be chosen to achieve a reasonable compromise between the convenience of the paint roller frame placement on the grid and the stability of the hanged paint roller frame when an extension pole is attached to the handle. FIG. 9 is a fragmentary cross view of the hook attached to the shaft along line 9 – 9 of FIG. 8, which represents the continuation of FIG. 3. It shows how the arcs 403 and 404 embrace the handle portion 175 of the shaft 2.

FIG. 10 shows how the hook 400 allows keeping over 3 gallons of paint in the 5-gallon paint bucket with the roller frame hanging on the grid above the paint surface. As it is clear from FIG. 11, the paint roller sleeve sinks in paint when a conventional roller frame is used for the same amount of paint.

The paint roller frame in accordance with the present invention can be embodied in many different ways. For example, connection of a bearing portion and an outer portion can be achieved by using various connection means. The preferred embodiment presented above was chosen for its simplicity and ability to better explain the principles of the invention. It is obvious to those skilled in the art that many variations may be made without departing from the scope and principles of the present invention as set forth in the appended claims.

Sincerely,



Lev Korenevsky  
03/06/2004